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Home and Village Soyfood Preparation

International Soybean Program
College of Agriculture
University of Illinois
at Urbana-Champaign



Overcoming Protein Deficiencies

Millions of people in large parts of the world continue to suffer from chronic protein and calorie deficiencies. One of the best solutions to this problem is to supplement cereal-based diets with whole soybeans.

On average, soybeans contain about 40 percent high-quality protein. By comparison, the rice prevalent in most Asian diets is only 9 percent protein; maize, popular in many Latin American countries, 12 percent; wheat, 15 percent; cassava, a staple in large areas of Africa, a mere 2 percent.

While most plant sources are deficient in several of the nine essential amino acids, soybeans are slightly deficient only in methionine. The soybean is also an excellent source of unsaturated oil, with most varieties averaging a content of about 20 percent. In addition, it has no cholesterol and is rich in vitamins, minerals, and calories.

INTSOY Basic Processing Concepts

Despite its high nutritional value, the soybean has been traditionally consumed as human food only in China, Japan, Korea, Indonesia, and Chinese population pockets across east and southeast Asia. The spread of soyfoods outside those areas has been limited by:

- The beany flavor associated with most traditional soyfoods.
- The long cooking time required to tenderize the beans.
- The need to inactivate antinutritional agents in the beans.

Initial research at the University of Illinois showed that all three problems could be overcome through the single step of blanching during the home preparation of soybeans:

- 1) Off-flavor develops by the action of an enzyme when damaged bean tissue comes in

contact with moisture. On the other hand, dropping dehulled beans into already boiling water inactivates the enzyme and permanently prevents the off-flavor.

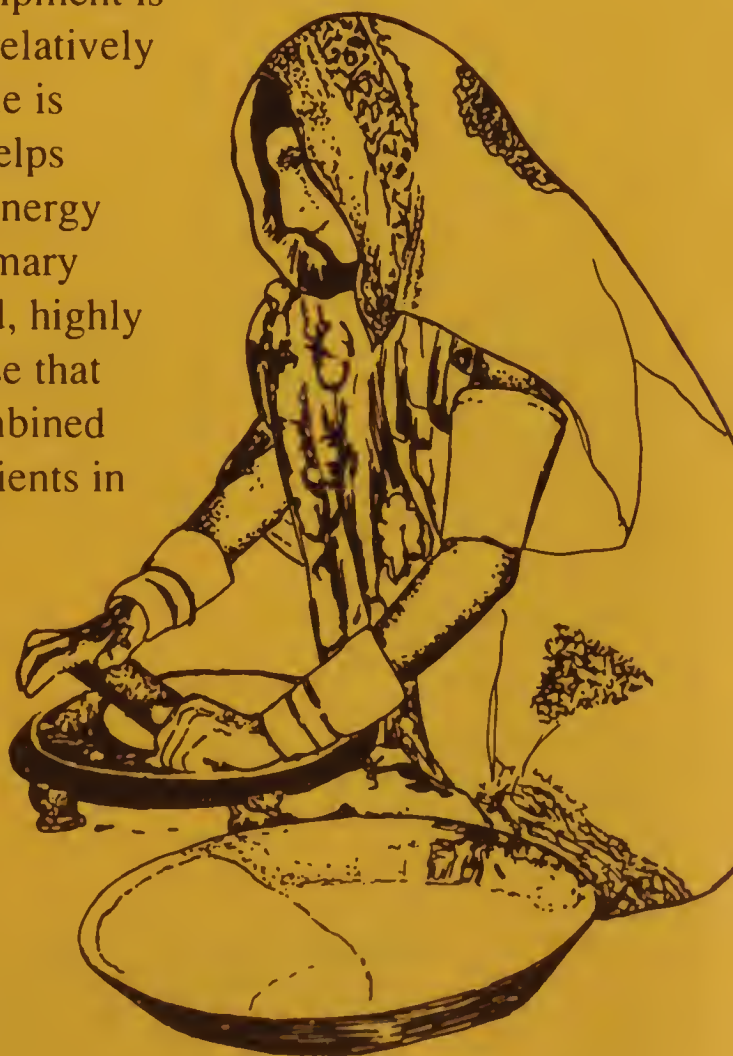
2) Blanching will also inactivate major antinutritional agents such as the trypsin inhibitors.

3) The time it takes to tenderize the beans can be cut at least in half by breaking the beans into grits and adding a small amount of baking soda to the blanching water.

A Practical Approach

The use of soybeans in the home or village offers a practical approach to improving the diets of those who need more and better quality protein. The small-scale methods devised from basic research by INTSOY and refined through countless hours of work with soyfoods programs in Sri Lanka, India, and Peru are simple and easily followed.

Expensive equipment is not needed. The relatively short cooking time is convenient and helps conserve scarce energy supplies. The primary product is a bland, highly nutritious soy base that can be easily combined with other ingredients in traditional local dishes.



Products and Processes

Soy Flour—Blanched soybeans can be sun dried in tropical climates and made into flour using simple home grinding techniques. This flour can be incorporated into a variety of unleavened, cereal-based products made in the home — flat bread, pan-cakes, gruels, cookies. For people whose diets are predominantly based on cereal grains, soy flour adds much needed protein and calories.

Weaning Foods—A serious nutritional problem in many developing countries is protein and/or calorie deficiencies in weaning children. Children are often weaned from the mother's milk to an adult diet which is very low in protein. As a result, there is a great need for a weaning food with a high protein and calorie content. Soy-cereal combinations provide ideal weaning foods that can be easily prepared in the home on a daily basis.

Tofu—This traditional oriental product is suitable for small-scale production. Its acceptability in other cultures depends on fitting its use to existing diet patterns. For example, fried tofu can be cooked into curries in much the same way as meat. This offers an inexpensive, highly nutritious alternative.

Tempeh—This product, traditional to the nation of Indonesia, is made using a fungal culture. Fresh tempeh has a short shelf life. Upon drying, tempeh develops a flavor similar to dried fish. Like tofu, it is suitable for small-scale production. This product has been well accepted in Sri Lanka where dried fish is an important protein source for middle- and low-income groups.

Soy Milk—This is an important product with wide potential for expanded use. INTSOY's simple home processing methods produce a soy milk with no trace of an off-flavor. It can extend the limited supply of cow's milk or serve as an alternative for the many people allergic to cow's milk. It can also be used as a cooking medium for many traditional food preparations.

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Roasted and Fried Soybeans—This highly nutritious snack food can be easily prepared in the home using simple methods.

Curries—Soybeans can be easily incorporated into many of the curries that are traditionally consumed by Asian peoples.

Sweets—Most sweet preparations made in the home from cereal flours can be enriched with soybeans.

A Record of Achievement

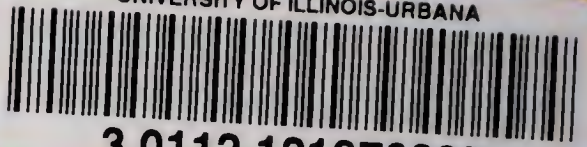
The INTSOY staff is determined to have its achievements judged not only in laboratories, but also in the homes and villages of nations struggling to improve the nutrition of their people. In Sri Lanka, for example, the results of the collaboration between INTSOY and the national soyfoods research program have already included:

- Refinement of a great many flavorful, nutritious, and often spicy soyfoods suited to local tastes.
- Opening of several small-scale commercial operations that supply consumers with affordable soy flour, soy milk, and weaning food.
- Development of teaching programs which have trained more than 20,000 people, including many extension workers, in simple techniques to process and cook soybeans in the home.

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